ONTARIO MINISTRY OF ENVIRONMENT
36936000023749

1970

OPERATING SUMMARY

BURLINGTON

Skyway

water pollution control plant

TD
367
.A56
B876
1970
MOE

LIBRARY COPY
JUN 15 1971
ONTARIO WATER
RESOURCES COMMISSION

ONTARIO WATER RESOURCES COMMISSION
Division of Plant Operations

TD
367
.A56
B876
1970

Burlington Skyway : water
pollution control plant.

81573

Water management in Ontario

Ontario
Water Resources
Commission

135 St. Clair Ave. W.
Toronto 195
Ontario

Once again we have the privilege of submitting to you our latest detailed report on financial progress and technical activity at your water pollution control plant.

The statistical information contained in this annual operating summary will undoubtedly be a useful barometer of efficiency. Of particular interest will be the comments and recommendations of the regional operations engineer, who was intimately connected with day-to-day operation throughout 1970.

Together with the extensive cost data provided, this information should assist greatly in your general understanding of the problems met and dealt with, and in furnishing a yardstick for possible future expansion.

D S Caverly

D. S. Caverly,
General Manager.

D McTavish

D.A. McTavish, P. Eng.,
Director,
Division of Plant Operations.

TD
227
B37
S69
W38
1970
MOE

asbc

CONTENTS

Title page. 1

Flow diagram . . . 2

Design data 3

'70 Review 4

Project costs . . . 6

Process data. . . . 9

Digitized by the Internet Archive
in 2015

https://archive.org/details/burlingtonskyway23749

ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN
D. J. Collins

VICE-CHAIRMAN
J. H. H. Root, M. P. P.

COMMISSIONERS
H. E. Brown
F. S. Hollingsworth
Dr. C. A. Martin
D. A. Moodie
L. E. Venchiarutti

GENERAL MANAGER
D. S. Caverly

ASSISTANT GENERAL MANAGERS
K. H. Sharpe
F. A. Voege
A. K. Watt

COMMISSION SECRETARY
W. S. MacDonnell

DIVISION OF PLANT OPERATIONS

Director
D. A. McTavish

Assistant Director
C. W. Perry

Regional Supervisor
P. J. Osmond

Operations Engineer
J. Wesno

135 St. Clair Avenue West
Toronto 195

BURLINGTON SKYWAY
water pollution control plant

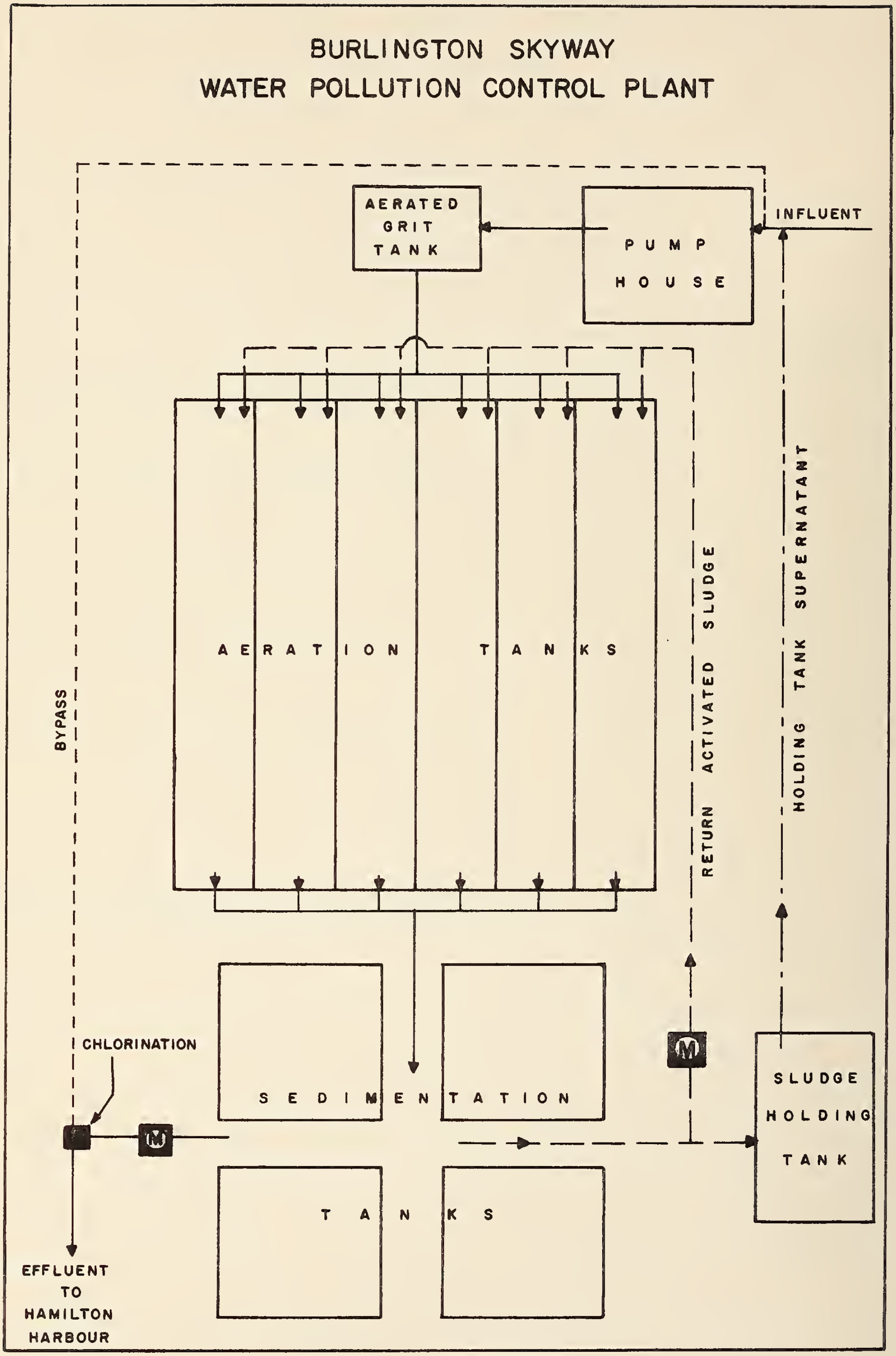
operated for

THE TOWN OF BURLINGTON

by the

ONTARIO WATER RESOURCES COMMISSION

1970 ANNUAL OPERATING SUMMARY



BURLINGTON SKYWAY
WATER POLLUTION CONTROL PLANT

DESIGN DATA

PROJECT NO.	2-0105-62	DESIGN FLOW	6 mgd
BOD - Raw Sewage	200 mg/l	SS - Raw Sewage	200 mg/l

PRETREATMENT

Coarse Screening

Type: Link Belt, mechanically-cleaned
Size: $2\frac{1}{2}$'' space

Lift Station Pumps (@ 30' tdh)

2 @ 6 mgd each; 2 @ 5 mgd each

Screening

Type: Link Belt, mechanically-cleaned
Size: 1'' space

Grit Removal

Type: Air degritter
Size: One 20.3' x 25' x 14.2'
Retention: 20.8 min

SECONDARY TREATMENT

Aeration Tanks

Type: Diffused air, single pass
Size: Six 270' x 27' x 15'
(660,300 ft. or 4.12 mil gal)
Retention: 16.5 hr
Loading: 9.5 lb BOD/1000 ft^3

Air Supply

Type: Hoffman multi-stage centrifugal blowers
Size: 3 - 4000 cfm (max); 1-6000 cfm (max)

Diffusers

Type: Saran-covered flexofusers
Spacing: 250 tubes per tank

Secondary Sedimentation

Type: Eimco
Size: Four 60' x 60' x 12' swd
(538,000 gal)
Retention: 4.1 hours
Loading: Surface, 434 gal/ft^2/day
Weir, 7,100 gal/ft/day

CHLORINATION

Type: Fischer & Porter
Size: Two 2000 lb/day

Chlorine Contact Chamber

- nil
- chlorination in outfall

OUTFALL

- to Hamilton Harbour

SLUDGE HANDLING

Type: Thickening tank, decanted
Size: One 20' dia x 9' depth
(2830 ft^3 or 1760 gal)

'70 REVIEW

GENERAL

The expansion of the plant from 3.0 to 6.0 mgd was completed in May 1970. It involved essentially the installation of larger raw sewage pumps, additional return sludge pumps and air blower and the construction of two additional final clarifiers and return sludge building. Major construction deficiencies with regard to return sludge metering and pump capacities were outstanding at year-end.

Accidental tall oil waste spills into the sewerage system from Hercules Chemical and Powder Limited were experienced on two occasions during the year. The firm was prompt and went to considerable expense to remove the gum-like waste from the plant facilities and equipment.

A number of meetings were held with the Town and James F. MacLaren Limited, Consulting Engineers, to discuss the provision of plant facilities and equipment for phosphate removal experiments early in 1971 by the consulting engineers. Subsequent to these experiments it is anticipated that a small pilot plant for phosphate removal will be installed at the plant.

EXPENDITURES

The 1970 operating costs for the Skyway plant were $103,062.05, an increase over 1969 of 27 percent.

PLANT FLOWS and CHLORINATION

The average daily flow of 4.1 million gallons represents an increase of 24% over 1969. Although this flow is considerably less than the plant's design capacity a review of the average daily flows for each month during the year indicates a consistent increase in this rate from January to December In November and December, the average daily flows were respectively 5.2 and 5.5 million gallons. If there is not a decrease in flows in the new year serious consideration should be given to initiating preparations for the next stage of expansion.

Chlorination is carried out between May 15 and October 15 only. The dosage required to maintain a 15 minute chlorine residual of 0.5 mg/l in the effluent was the same as 1969 at 3.4 mg/l.

PLANT EFFICIENCY

The average raw sewage strength of 157 mg/l BOD and 218 mg/l suspended solids was respectively 1.3% and 18% greater than in 1969. The BOD and suspended solids reductions of 94% were similar to the reductions in the previous year. The effluent quality of 9 mg/l BOD and 13 mg/l suspended solids was also similar to the effluent quality in 1969.

SLUDGE DIGESTION and DISPOSAL

A total of 10,561 cubic yards of waste activated sludge was removed from the plant during the year. This represents an increase of 29% over the previous year and is indicative of the increased suspended solids concentration in the raw sewage.

CONCLUSIONS

The plant operated satisfactorily during the year and produced a good quality effluent.

The average daily flow for the year was 4.1 million gallons, representing 66% of the plant's new design capacity. The monthly flows during the year increased consistently from a daily rate of 2.2 million gallons in January to 5.5 million gallons in December.

It is recommended that preparations for the next stage of expansion be considered in the near future if there is not a decrease in flows from the rates recorded in November and December 1970.

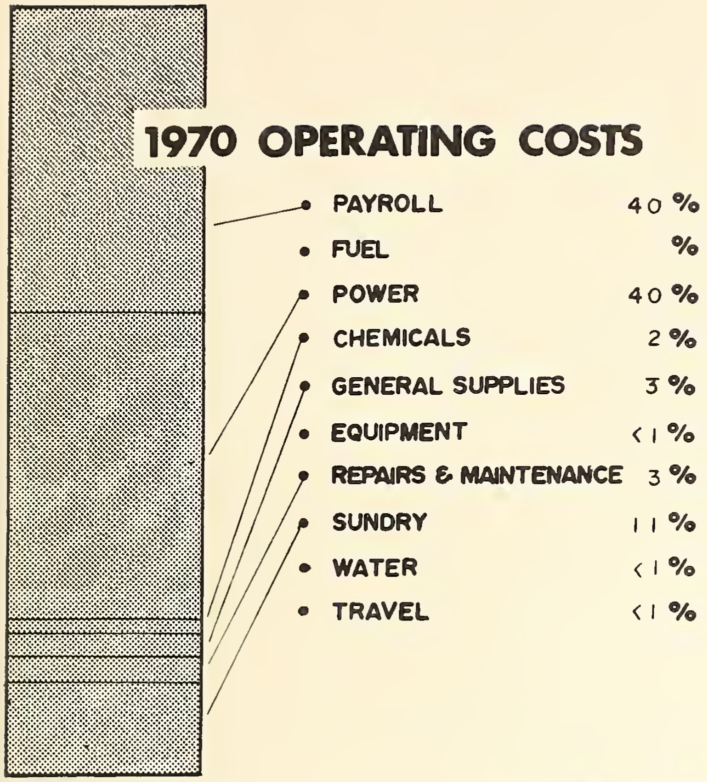
PROJECT COSTS

NET CAPITAL COST (Final)	$1,796,844.53
DEDUCT - Portion financed by CMHC/MDLB (Final)	1,240,059.57
Long Term Debt to OWRC	$ 556,784.96
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1970	$ 187,690.49
Net Operating	$ 99,911.66
Debt Retirement	20,200.00
Reserve	10,172.38
Interest Charged	31,194.56
TOTAL	$ 161,478.60

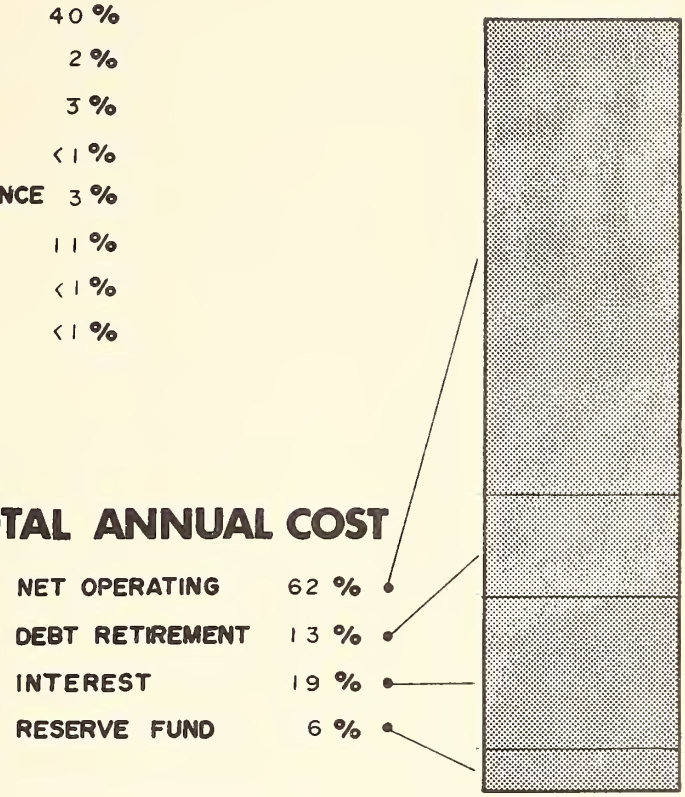
RESERVE ACCOUNT

Balance @ January 1, 1970	$ 36,419.50
Deposited by Municipality	10,172.38
Interest Earned	2,571.90
	$ 49,163.78
Less Expenditures	2,600.00
Balance @ December 31, 1970	$ 46,563.78

1970 OPERATING COSTS



TOTAL ANNUAL COST



Yearly Operating Costs

YEAR	MILLION GALLONS TREATED	TOTAL OPERATING COSTS	COST PER MILLION GAL	COST PER LB OF BOD REMOVED
1966	1011.46	$ 59,744.34	$59.07	3 cents
1967	1419.27	64,725.24	45.60	5 cents
1968	1365.20	69,386.01	50.82	4 cents
1969	1218.10	80,952.25	66.46	5 cents
1970	1500.1	103,062.06	68.70	5 cents

MONTHLY OPERATING COSTS

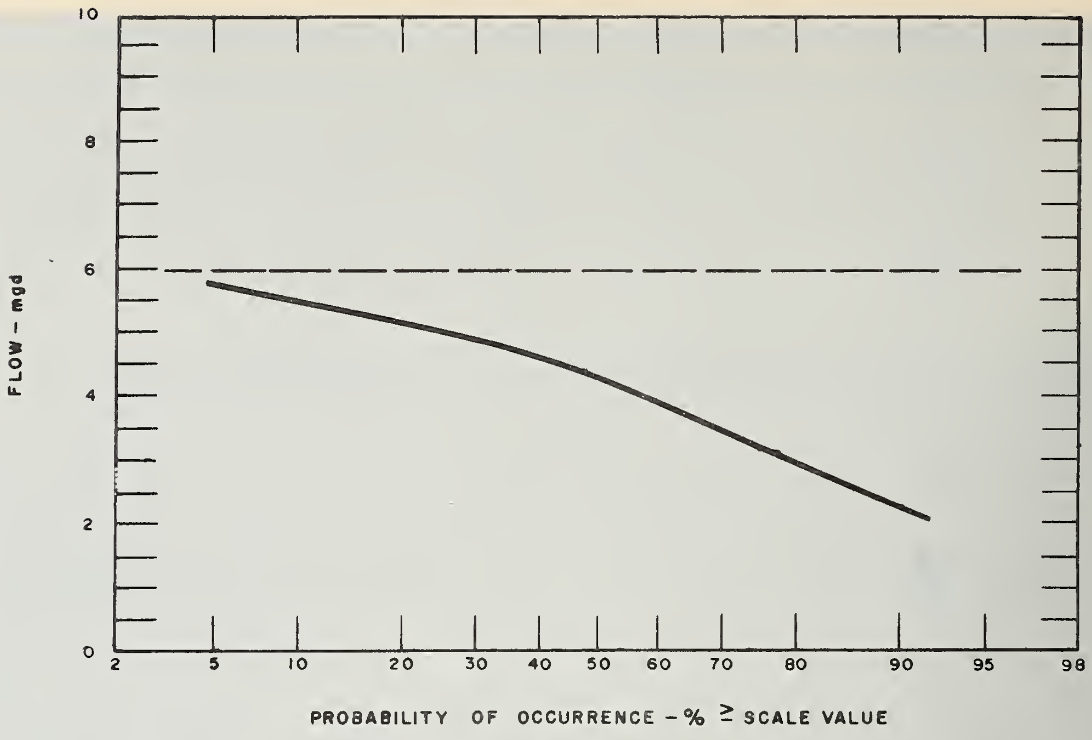
MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDRY *	WATER	TRAVEL
JAN	7488.79	4409.32	288.50	-	2629.66	-	60.00	-	50.16	21.00	30.15	-
FEB	7496.17	3469.99	-	-	3339.76	-	66.06	483.00	15.37	72.94	30.15	18.90
MAR	8061.39	4349.84	-	-	2559.63	-	134.37	115.76	81.98	789.66	30.15	-
APR	6540.13	2511.87	-	-	2713.70	-	130.41	11.92	134.21	927.62	30.15	80.25
MAY	5561.87	1193.01	256.12	-	2890.93	-	146.92	-	235.04	809.70	30.15	-
JUNE	9547.02	4301.82	698.49	-	3257.55	-	71.44	-	170.00	1017.57	30.15	-
JULY	9592.60	1635.17	1153.50	-	3268.15	1932.00	269.12	-	320.18	910.08	30.15	74.25
AUG	12286.77	6388.68	1572.09	-	3346.10	-	248.83	-	-	566.06	30.15	134.86
SEPT	9597.29	2885.73	297.47	-	3384.93	-	408.16	(132.49)	467.11	2256.23	30.15	-
OCT	7977.01	2169.79	-	-	3413.18	-	1085.06	158.49	-	1038.29	30.15	82.05
NOV	7360.22	3049.77	-	-	3394.82	-	171.96	10.21	587.87	70.59	30.15	44.85
DEC	11552.79	505.09	-	-	6698.21	(11.76)	254.85	-	1452.45	2720.30	60.30	(126.65)
TOTAL	103062.05	36870.08	4266.17	-	40896.62	1920.24	3047.18	646.89	3514.37	11200.04	391.95	308.51

BRACKETS INDICATE CREDIT

* SUNDRY INCLUDES SLUDGE HAULAGE COSTS WHICH WERE $10,046.25

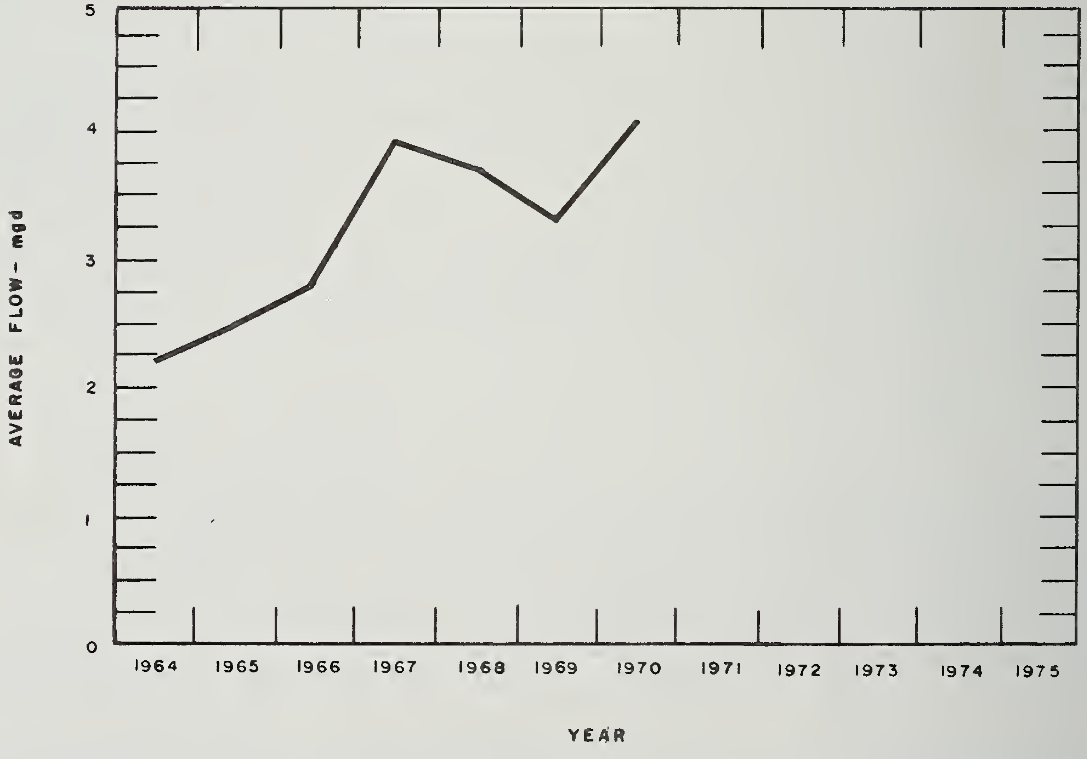
Note: Total does not include year-end adjustments.

PROCESS DATA



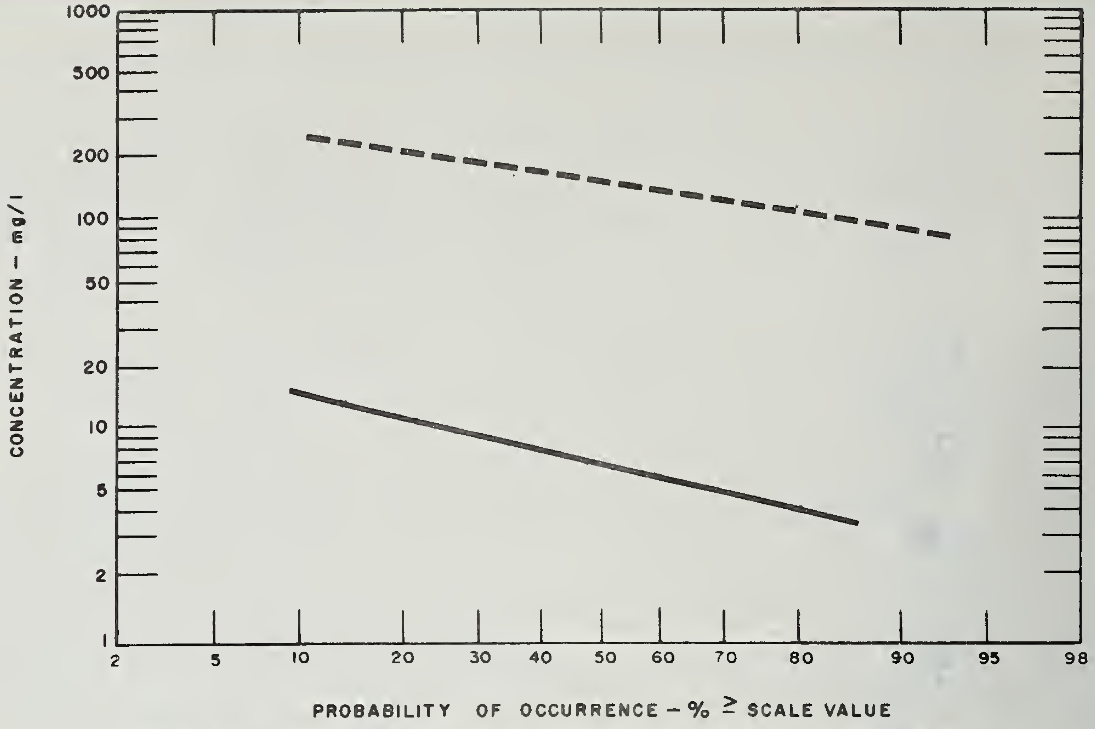
FLOWS

NOMINAL CAPACITY 6·0 MGD

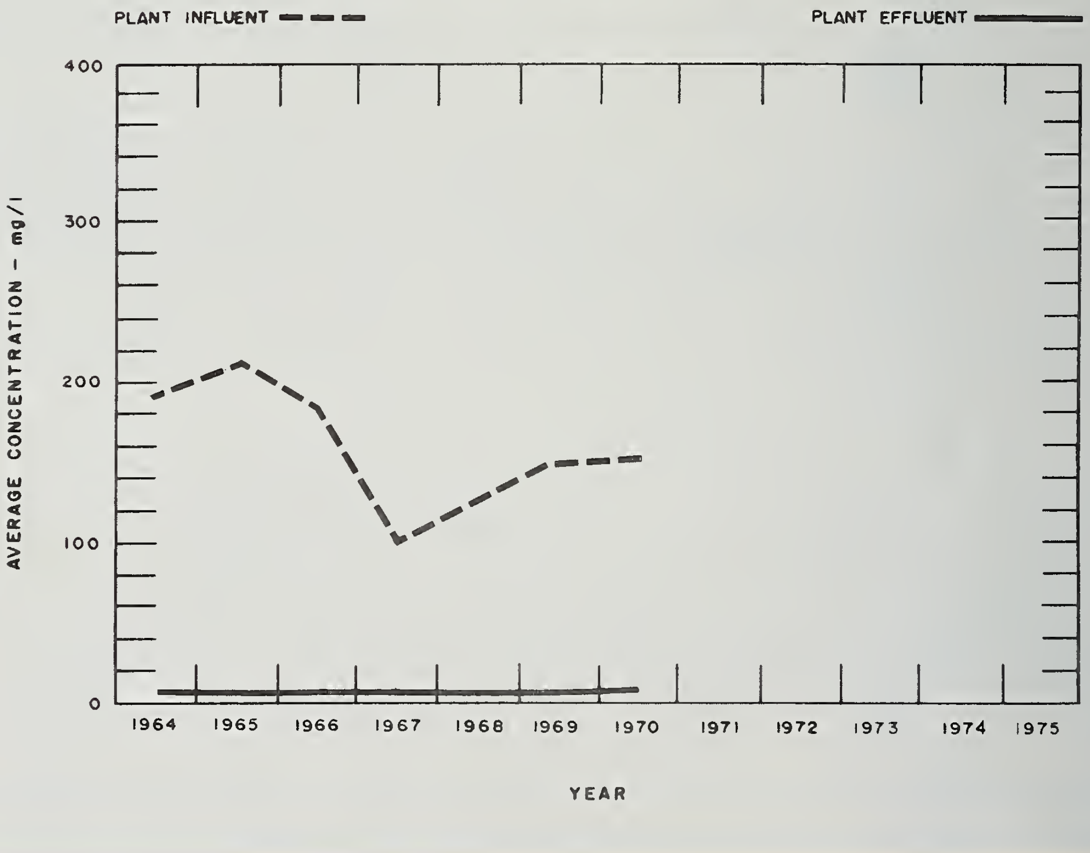


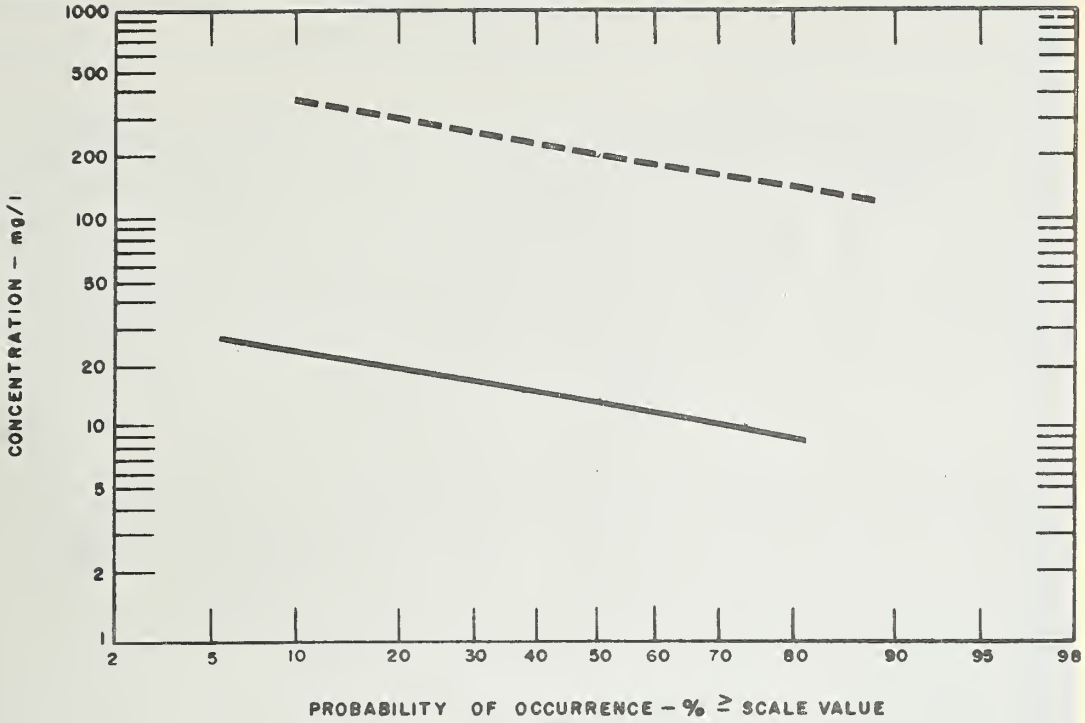
PLANT FLOWS and CHLORINATION

MONTH	TOTAL FLOW mil gal	AVERAGE DAILY FLOW mil gal	MAXIMUM DAILY FLOW mil gal	MINIMUM DAILY FLOW mil gal	CHLORINE USED 10^3 pounds	DOSAGE mg/l
JAN	68.9	2.22	4.3	.1	0.3	1.4
FEB	64.7	2.31	3.6	1.0	0	0
MAR	95.3	3.07	5.0	2.1	0	0
APR	130.1	4.35	6.6	1.9	0	0
MAY	136.7	4.49	5.8	3.3	2.7	3.6
JUNE	122.5	4.09	5.2	2.2	5.3	4.3
JULY	132.9	4.30	6.0	3.4	5.0	3.7
AUG	136.5	4.41	5.7	2.1	4.1	3.0
SEPT	143.1	4.79	5.8	4.2	4.1	2.9
OCT	142.9	4.61	5.5	3.8	1.9	3.0
NOV	156.0	5.20	6.3	4.0	-	-
DEC	170.5	5.50	6.7	4.4	-	-
TOTAL	1500.1	-	-	-	23.4	-
AVERAGE	-	4.11	-	-	3.4	3.4

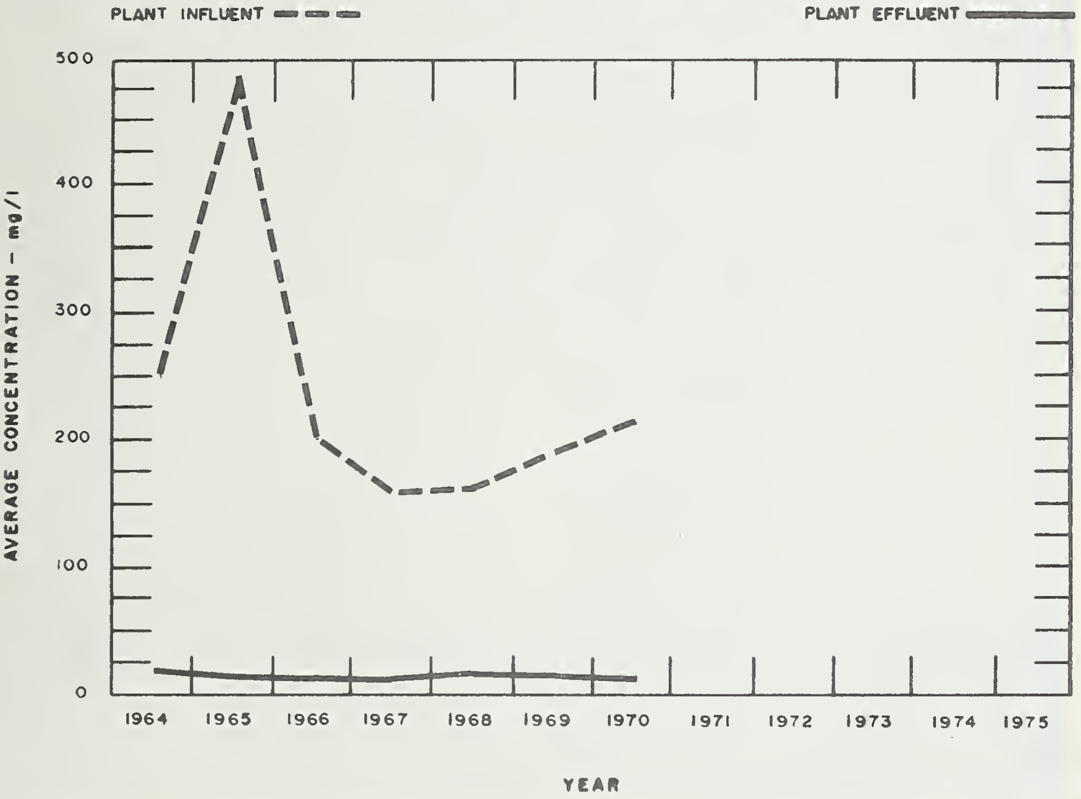


BIOCHEMICAL OXYGEN DEMAND





SUSPENDED SOLIDS



PLANT EFFICIENCY

MONTH	BIOCHEMICAL OXYGEN DEMAND						SUSPENDED SOLIDS						GRIT REMOVED
	INFLUENT		EFFLUENT		REDUCTION		INFLUENT		EFFLUENT		REDUCTION		
	n	mg/l	n	mg/l	%	10^3 pounds	n	mg/l	n	mg/l	%	10^3 pounds	cu ft
JAN	1	150	1	44	71	73	2	267	2	36	87	159	510
FEB	2	130	2	8	94	79	4	208	4	12	94	127	150
MAR	2	160	2	9	94	144	6	210	6	13	94	188	280
APR	2	180	2	4	98	229	7	221	7	11	95	273	270
MAY	2	167	2	16	90	206	6	198	6	12	94	254	280
JUNE	3	267	3	7	97	318	6	266	6	10	96	306	330
JULY	2	92	2	5	95	116	5	136	6	17	88	158	400
AUG	2	130	2	3	98	173	6	248	6	14	94	319	195
SEPT	2	90	2	3	97	124	5	304	5	12	96	418	130
OCT	2	130	2	6	95	177	5	139	5	10	93	184	350
NOV	2	135	2	5	96	133	6	200	6	14	93	290	330
DEC	3	183	3	11	94	293	7	230	6	14	94	368	360
TOTAL	25	-	25	-	-	2065	65	-	65	-	-	3044	3585
AVERAGE	-	157	-	9	94	172	-	218	-	13	94	254	299

NOTE – n is the number of samples taken

AERATION

MONTH	AVG DAILY FLOW mil gal	M L S S CONCN mg/l	F/M lb BOD / lb MLSS	AIR USED 1000 cu ft / lb BOD		WASTE ACTIVATED SLUDGE		
					SOLIDS PRODUCED 10^3 lb/DAY	VOLUME DISPOSED 10^3 gal	TOTAL SOLIDS %	LIQUID HAULED cu yd
JAN	2.2	3000	.03	4.1	.6	131.4	1.4	780
FEB	2.3	3690	.03	3.3	1.1	163.8	1.9	972
MAR	3.1	4580	.03	1.7	1.2	151.6	2.5	900
APR	4.3	3800	.06	1.2	1.1	148.3	2.2	880
MAY	4.4	3230	.07	1.6	1.3	153.6	2.5	912
JUNE	4.1	3720	.09	1.3	.6	72.7	2.4	432
JULY	4.3	5060	.02	3.7	.8	100.1	1.9	594
AUG	4.4	6490	.02	2.7	1.2	191.8	1.9	1138
SEPT	4.8	8130	.02	3.5	2.1	215.3	2.9	1278
OCT	4.6	5910	.03	2.4	1.8	199.2	2.8	1181
NOV	5.2	5840	.03	1.8	1.6	220.4	2.3	1308
DEC	5.5	5070	.05	1.1	.2	31.4	1.8	186
TOTAL	-	-	-	-	-	1779.6	-	10561
AVERAGE	4.1	4880	.04	2.4	1.1	148.3	2.2	880

Date Due

ONTARIO WATER RESOURCES COMMISSION
DIVISION OF PLANT OPERATIONS.

BURLINGTON SKYWAY

OPERATING SUMMARY - 1970

TD227/B87/S69/W38/1970/MOE
C-1

DATE ISSUED TO ashc

TD227/B87/S69/W38/1970/MOE
Ontario Water Resources Co
Burlington Skyway
water pollution ashc
c.1 a aa

Canada

TD
367
.A56
B876
1970

Burlington Skyway : water pollution control plant.
81573

Water management in Ontario